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schools the curricula of the students of civil engineering provide one term only for geology. The student is expected to master the principles of geology and to find the applications in that brief time without any previous training in physiography, mineralogy, petrology or paleontology. It is obviously a difficult task to arrange the material so that the groundwork of principles is made clear in the short time allotted for the study, and applications emphasized sufficiently to make the study of much practical value. This difficulty is happily met in this volume by brief and concise statements of principles followed by ample and well-chosen illustrations.

The book is well arranged for the mature and serious-minded beginner who wishes to get the maximum of material in a short time. The more advanced student will find also many applications of geology brought from widely scattered sources and some which are not treated elsewhere. Separate chapters are devoted to rock minerals, rocks, structural geology and metamorphism, rock weathering and soils, rivers, lakes, wave action, underground waters, landslides, glacial deposits, cements, clays, coal, petroleum and gas, road material, and ore deposits. The mechanical features of the work are excellent; particularly noteworthy are the clearly executed photographs and line drawings.

W. H. EMMONS

MINNEAPOLIS

Die Umwelt des Lebens. Eine physikalisch-chemische Untersuchung über die Eignung des Anorganischen für die Bedürfnisse des Organischen. Von LAWRENCE J. HENDERSON; übersetzt von R. BERNSTEIN. Wiesbaden, J. F. Bergmann. 1914.

This volume is the German translation of the author's book, "The Fitness of the Environment," recently reviewed in these columns.¹ There are a few additional features; the table of contents contains a very complete and convenient summary of the whole book, important sentences or paragraphs are italicized,

¹ SCIENCE, N. S., 1913, p. 337.

and a brief final chapter has been added; there is also an interesting and apposite quotation from du Bois-Reymond in a footnote on page 161; and the subject-index has been omitted. Otherwise the book remains unchanged.

In his final chapter the author calls attention to the existence of "a hitherto unrecognized order among the properties of the chemical elements,"—referring to the remarkable manner in which certain fundamental properties, which have largely conditioned the course taken by the evolutionary process, are distributed among the elements. These properties, far from being distributed with approximate uniformity—as the periodic system might lead us to expect—attain strongly marked maxima, or are, so to speak, concentrated, in relatively few elements, which at the same time are among the most abundant and widespread, namely: carbon, hydrogen and oxygen. "As a result of this fact there arise certain characteristics of the cosmic process which could not otherwise occur:" the implication is that at the outset of cosmic evolution there were present in advance all of the conditions needed for the development of physico-chemical systems having *vital* peculiarities, *i. e.*, possessing the complexity, activity and stability in a changing environment which are essential to living organisms. The properties of these three elements—and of no others—show a most detailed "fitness" for the production of just such systems. If, therefore, the main outcome of evolution be regarded as the development of living organisms, "the biologist may rightly regard the universe in its very essence as biocentric."

The volume is attractively printed and is dedicated to Karl Spiro.

R. S. L.

THE OXIDATION OF NITROGEN AND HOW
CHEAP NITRATES WOULD REVOLU-
TIONIZE OUR ECONOMIC LIFE

How is Atmospheric Nitrogen Oxidized?

It is not many years ago (1898) that Sir William Crookes sounded the note of alarm